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STUDIES IN ANTARCTIC LICHENS I:

Notes on *Caloplaca citrina* (Hoffm.) Th.Fr.

and *Physcia caesia* (Hoffm.) Hampe.

by

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SUMMARY

In a previous paper (Filson, 1966), the author discussed two species of lichen, *Parmelia coreyi* Dodge & Baker and *Pyrenodesmia mawsonii* Dodge but at that time he was uncertain of their correct systematic position. In this paper *Pyrenodesmia mawsonii* Dodge is discussed with the suggestion that it should be treated as a synonym of *Caloplaca citrina* (Hoffm.) Th.Fr. Three species of *Parmelia*, *P. coreyi* Dodge & Baker, *P. johnstoni* Dodge and *P. variolosa* Dodge & Baker, are placed in synonymy under *Physcia caesia* (Hoffm.) Hampe.

MATERIALS

The author desires to point out first that he has not seen type material of any of the species discussed in this paper and bases his conclusions on specimens determined by Dr. Carroll Dodge. These specimens, housed in the National Herbarium of Victoria, form part of a large batch of B.A.N.Z.A.R.E. lichen material found in the basement of the University of Adelaide in 1972.

The author has also received extensive lichen collections from all Australian Antarctic bases as part of the current biological programme.

DISCUSSION

Caloplaca citrina (Hoffm.) Th.Fr. in *Nova Acta Sci. Upsal.*, Ser. 3 3 : 218 (1861).

Verrucaria citrina Hoffm. *Deutschl. Flora* 198 (1796).

Pyrenodesmia mawsonii Dodge in *B.A.N.Z. Antarct. Res. Exped. Rep.* 7 : 232 (1948).

* National Herbarium of Victoria.

There were no authenticated collections of *Pyrenodesmia mawsonii* in Australian herbaria at the time Filson (1966) wrote his Mac.Robertson Land paper and he was uncertain about referring material to this species. In the light of more ample collections it is now possible to interpret more accurately Dodge's original description (Dodge, 1948:232). In his description Dodge does not mention the presence of soredia and as this feature is very pronounced in the specimens on which the present author based his interpretation of the species, it raises some doubt as to whether Professor Dodge and the author were in fact discussing the same taxon.

However, from the description given in Dodge, the small pulvinate marginate squamules found growing over mosses in the Mac.Robertson Land region clearly fit the description of *Pyrenodesmia mawsonii* when in a non-sorediate condition. These squamules are also identical with specimens of *Caloplaca citrina* (Hoffm.) Th.Fr. found growing in Australia. All of the Antarctic material seen by the present author is sterile, but the apothecial details of Australian specimens of *Caloplaca citrina* compare favorably with those given by Dodge for *Pyrenodesmia mawsonii*.

It is certain that collections from Antarctica referred to *Pyrenodesmia mawsonii* by Filson are *Caloplaca citrina* and it is almost certain that *Pyrenodesmia mawsonii* should be placed in synonymy under it.

SPECIMENS EXAMINED (additional to Filson, 1966):

Princess Elizabeth Land—valley south from Club Lake, Vestfold Hills, Knowles Kerry, 4.i.1973 (MEL 1011943); Filla Island, Rauer Group, Knowles Kerry, 9.i.1973 (MEL 1011944); Hop Island, Rauer Group, Knowles Kerry, 8.i.1973 (MEL 1011950); Lichen Island, Knowles Kerry, 7.xii.1972 (MEL 1011969).

Mac.Robertson Land—Mawson, A. M. Gwynn A.N.A.R.E. AB/54 Li40, ii.1954 (Mel 1011970).

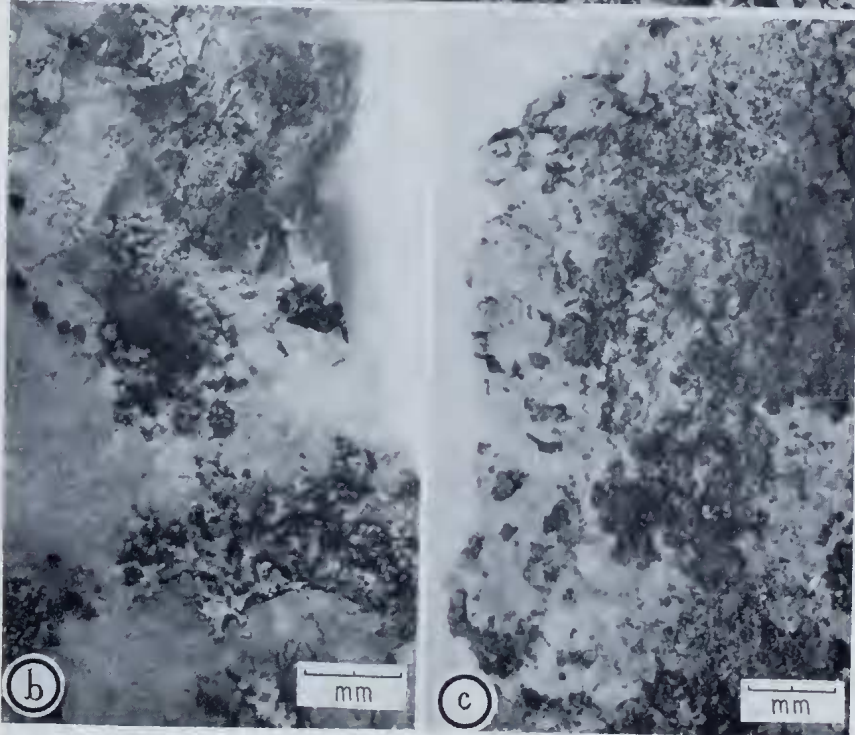
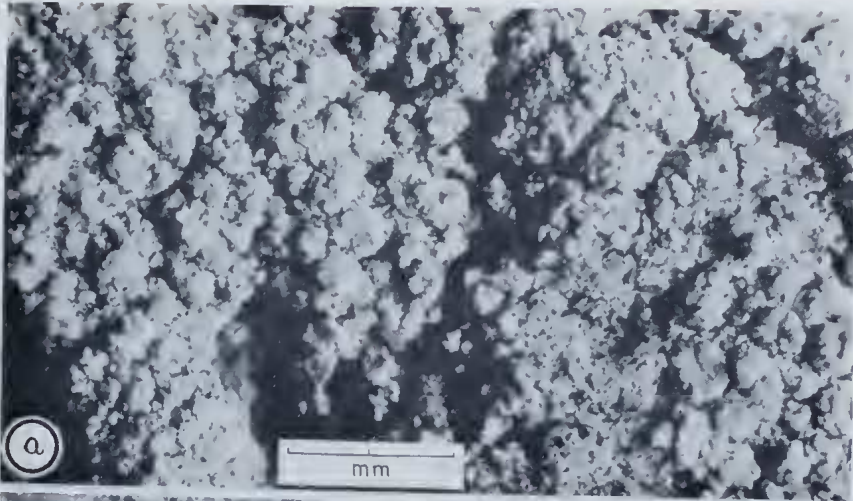
Australia—14.5 km east of Cooma on the Numeralla road, N.S.W., Rex Filson 7883b, 2.xii.1965 (MEL 26315 p.p.); Wyperfeld National Park, Victoria, Rex Filson 14328, 17.xi.1971 (MEL 1010666); Bailey's Rocks, 12 km east of Poolaijelo, 51.5 km north of Casterton, Victoria, Rex Filson 14699, 18.v.1973 (MEL 1011972).

Yugoslavia—Dalmatia, Insula Korcula, Banja Zrnovska, A. Vezda, 12.vii.1968 (MEL 1010876).

PLATE 1.

Caloplaca citrina (Hoffm.) Th.Fr. a. Specimen, MEL 9109, from Casey Range, Mac.Robertson Land, Antarctica, growing on sandy soil. b. Specimen, MEL 1011972, from Bailey's Rocks, 12.87 km east of Poolaijelo, Western Victoria, Australia, growing on rock. c. Specimen, MEL 1011969, from near the summit cairn, Lichen Island, Princess Elizabeth Land, Antarctica.

PLATE I



Physcia caesia (Hoffm.) Hampe in *Fürnr. Naturh. Topogr. Regensberg*. 2: 250 (1839).

Lichen caesius Hoffm. *Enum. Lich.* 65 (1784).

Parmelia variolosa Dodge & Baker in *Ann. Miss. Bot. Gard.* 25: 592 (1938).

Parmelia coreyi Dodge & Baker *l.c.* 593 (1938).

Parmelia johnstoni Dodge in *B.A.N.Z. Antarct. Res. Exped. Rep.* 7: 191 (1948).

Filson (1966) was dubious as to the systematic position of *Parmelia coreyi* Dodge & Baker. The ashy-white thallus seemed to suggest a species of *Physcia* rather than *Parmelia*. He has now had the opportunity of studying more material from the Antarctic as well as from Australia and other localities.

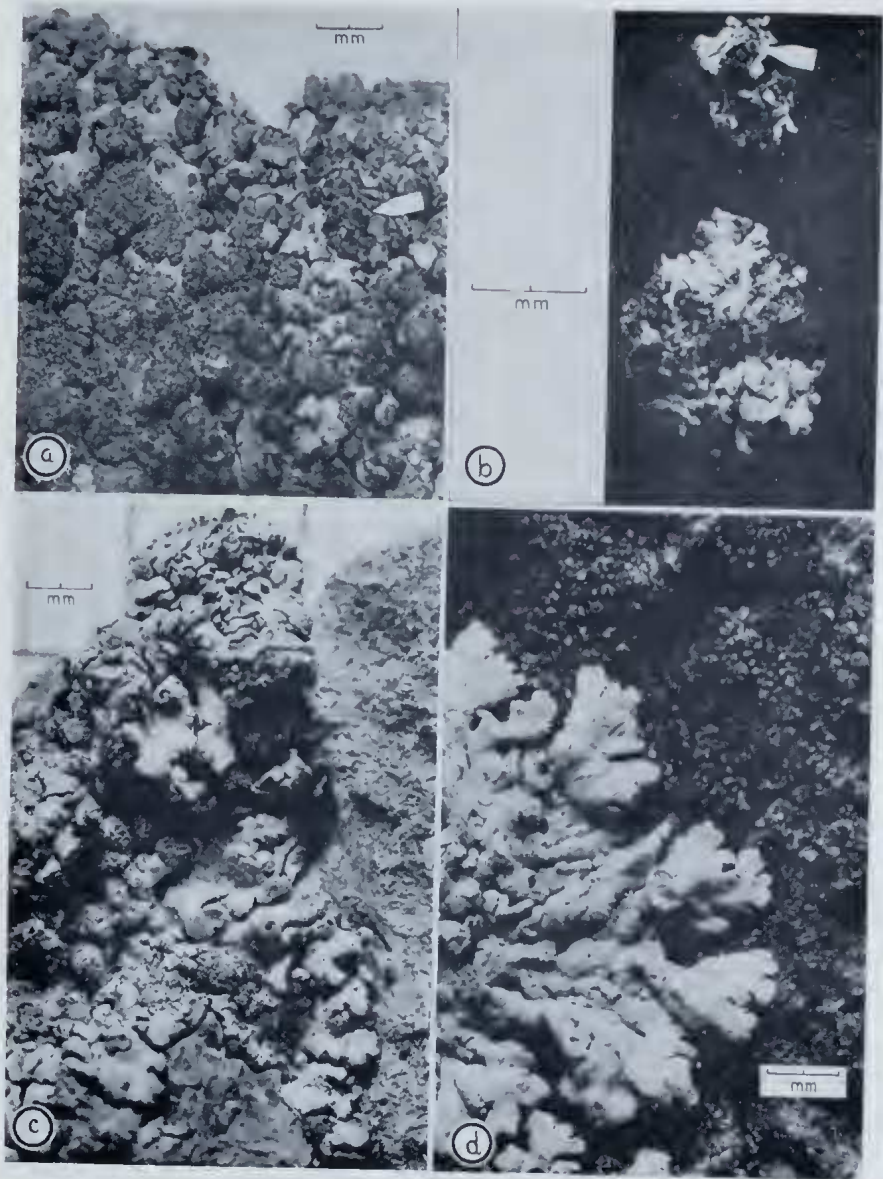
In Antarctica the thallus of this species is fragile, ashy-white to bluish-grey, with the older portions heavily maculate and sometimes bleaching to white and then yellowish on the top where they come in contact with snow and frozen particles. Soralia are present and the older lobes sometimes dissolve into a mass of thick granular soredia. It is extremely variable in lobe width. Thalli growing on rock are more robust than those growing over mosses. The latter thalli tend to be finer with their lobes becoming more strongly concave as the thallus presses into the moss heads. *Parmelia variolosa* represents this finer form and the "smooth, pruinose primuline yellow" described by Dodge & Baker (1938: 594) is caused by bleaching but in protected places between moss heads and on the undersides of the cushions the thallus is grey and maculate. The yellow bleaching effect has been noted in the typical form when it grows over the tops of stones where exposure conditions are similar. The Antarctic population of this lichen is macroscopically indistinguishable from *Physcia caesia* as found in Australia.

The most definite feature that separates the genera *Parmelia* and *Physcia* concerns the spores. In *Parmelia* the spores are simple and colourless, but they are two-celled and dark in *Physcia*. There seems to be some confusion in the interpretation of the specimens examined by their respective authors when they first described these three entities (*Parmelia variolosa*, *P. coreyi* and *P. johnstoni*) as distinct species.

PLATE 2.

Physcia caesia (Hoffm.) Hampe a. Specimen, MEL 1011966, from Mawson, Mac.Robertson Land, determined as *Parmelia johnstoni* by Dodge. Apothecia are those of *Lecanora expectans* Darb. b. Specimen, MEL 1011925, from Cape Bruce, Mac.Robertson Land, determined as *Parmelia variolosa* by Dodge. Apothecia are those of *Lecanora expectans* Darb. c. Detail of MEL 1011966 showing the thallus lobe edges and the soralia. d. Specimen, MEL 28055, from Ranga Cave, Flinders Island, Bass Strait, Australia, showing the thallus lobe edges and soralia.

PLATE 2



In *Parmelia coreyi* the apothecia were described as rare. All of the material of *P. johnstoni* was "badly fragmented, whether in formalin or dried, so it is has been very difficult to interpret. The apothecia are all old or very young, with only traces of the thecium left." (Dodge, 1948 : 191). The discussion on *P. variolosa* says "The apothecia are extremely rare, and it is difficult to establish their identity with the thallus. Apparently in the apothecial regions the thallus enlarges, becomes distorted and more floccose with an increased algal content." (Dodge & Baker, 1938 : 594). The present author has seen fragmentary material determined by Dodge as *P. variolosa* from Cape Bruce. It contains distorted areolae with apothecia (photo, plate 2b). The apothecia are up to 0.5 mm in diameter, more or less circular with a prominent margin and the disk is reddish-brown. The areolae are similar to those of *Lecanora expectans* Darb. A specimen from Mawson (Gwynn, AB/54/Li44) also has apothecia and this specimen (photo, plate 2a) has been identified in the past as *Parmelia johnstoni* Dodge. The thallus lobes are like those of *Physcia caesia*, whilst the apothecia actually resemble those of *Lecanora expectans* and are not attached to the *Physcia* lobes at all but are in fact growing up between them. This confusion certainly has arisen because the material was collected in a fragmentary condition and the authors of the names did not have the opportunity to study the specimens in the field.

Filson (1966 : 57) suggested that *Parmelia coreyi*, *P. johnstonii* and *P. leucoblephara* all represented the same species. This opinion is erroneous because *P. leucoblephara* was described (Dodge & Baker, 1938 : 593) as having long branched cilia. This feature excludes it from being included in the other two species as formerly understood. Further discussion on *Parmelia leucoblephara* will be presented in another paper.

The chemistry of the Antarctic material is the same as that for the Australian specimens—thallus and medulla K + yellow, and both atranorine and zeorine has been demonstrated in G.E.

SPECIMENS EXAMINED (additional to Filson, 1966):

Mac.Robertson Land—Mawson, A. M. Gwynn A.N.A.R.E. AB/54/Li44, ii.1954 (MEL 1011966) [this specimen is cited in Dodge (1955 : 145) as Li22 *Parmelia johnstoni* and in a personal communication with the Antarctic Division, Melbourne as "sterile and more sorediate than usual"]; Mawson, A. M. Gwynn A.N.A.R.E. AB/54/Li43, ii.1954 (MEL 1011965) [cited in Dodge (1955) as Li23 *Parmelia johnstonii*]; Mawson, R. O. Summers A.N.A.R.E. AB/54/Li54, i.1954 (MEL 1011967); Mawson, R. O. Summers, A.N.A.R.E. AB/54/Li58, i.1954 (MEL 1011968); rocks

PLATE 3.

Crystals produced by substances in the microcrystal test solutions, recrystallized from the acetone extract of *Physcia caesia* (Hoffm.) Hampe, collected at Mawson, Mac.Robertson Land, A. M. Gwynn ANARE AB/54/Li43, ii.1954 (MEL 1011965). a. Atranorine recrystallized in G.E. b. Zeorine recrystallized in G.E.

PLATE 3



near shore, Cape Bruce, B.A.N.Z.A.R.E. 108-18, 18.ii.1931 (AD) [cited in Dodge (1948 : 192) as *Parmelia johnstonii*]; rocks near the shore, Cape Bruce, B.A.N.Z.A.R.E. 108-39, 18.ii.1931 (MEL 1011925).

Queen Mary Land—L/II. Possession Nunatak, C. T. Harrison A.A.E. 61-1, 25.xii.1912 (AD) [cited in Dodge (1948 : 193) as *Parmelia variolosa*.]

King George V (Adelie) Land—Cape Denison, D. Mawson A.A.E. 16, 1912 (AD) [cited in Dodge (1948 : 193) as *Parmelia variolosa*.]

Wilkes Land—Bailey Peninsula, near Rx site, Casey Station, Budd Coast, D. J. Luders CB72/05b, 19.ix.1972 (MEL 1011988).

Princess Elizabeth Land—Adjacent to Flying Fox over the Ellis Fjord, Vestfold Hills, Knowles Kerry A.N.A.R.E., 4.i.1973 (MEL 1011940); near summit cairn, Lichen Island, Knowles Kerry A.N.A.R.E., 7.xii.1972 (MEL 1011973).

Australia—14.5km east of Cooma on the Numeralla road, N.S.W., Rex Filson 7883, 2.xii.1965 (MEL 26315 p.p.); Little River Gorge, 8 km east of Wulgulmerang, Victoria, Rex Filson 8363, 9.iii.1966 (MEL 26323); Ranga Cave, Flinders Island, Furneaux Group, Bass Strait, John Whinray, 23.xii.1966 (MEL 28055); eastern end of South-east beach, Babel Island, Furneaux Group, Bass Strait, John Whinray, 12.ii.1967 (MEL 28069).

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